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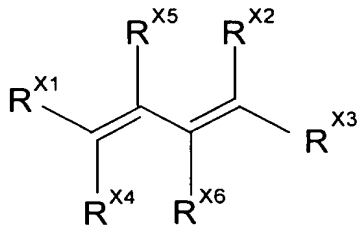
DT12 Rec'd PCT/PTO 23 DEC 2004

Claims:

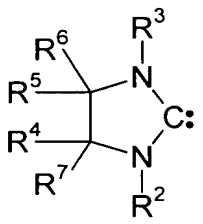
1. A process for the catalytic telomerization of acyclic olefins having at least two conjugated double bonds (I)



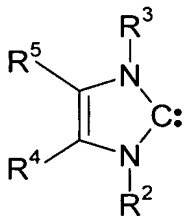
(I)

with at least one nucleophile,

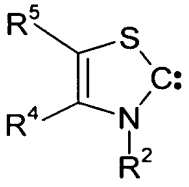
wherein mixtures of 1,3-butadiene with other C_3-, C_4- and/or C_5-hydrocarbons are used as acyclic olefins having at least two conjugated double bonds, with alkynes and if appropriate 1,2-butadiene being removed prior to the telomerization reaction, and complexes comprising metals of groups 8 to 10 of the Periodic Table of the Elements and at least one carbene ligand having one of the formulae



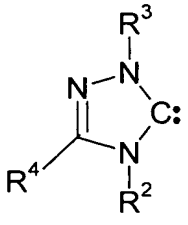
(III)



(IV)



(V)



(VI)

where

R^{X1}, R^{X2}, R^{X3}, R^{X4}, R^{X5}, R^{X6}: are each H

R^2; R^3: are identical or different and are each a) a linear, branched, substituted or unsubstituted cyclic or alicyclic alkyl group having from 1 to 24 carbon atoms,

or b) a substituted or unsubstituted, monocyclic or polycyclic aryl group having from 6 to 24 carbon atoms

or c) a monocyclic or polycyclic, substituted or unsubstituted heterocycle having from 4 to 24 carbon atoms and at least one heteroatom from the group consisting of N, O, S,

R^4, R^5, R^6, R^7: are identical or different and are each hydrogen, alkyl, aryl, heteroaryl, -CN, -COOH, -COO-alkyl, -COO-aryl, -OCO-alkyl, -OCO-aryl, -OCOO-alkyl, -OCOO-aryl, -CHO, -CO-alkyl, -CO-aryl, -O-alkyl, -O-aryl, $-NH_2$, -NH(alkyl), $-N(alkyl)_2$, -NH(aryl), $-N(alkyl)_2$, -F, -Cl, -Br, -I, -OH, $-CF_3$, $-NO_2$, -ferrocenyl, $-SO_3H$, $-PO_3H_2$, where the alkyl groups have 1-24 carbon atoms and the aryl groups have from 5 to 24 carbon atoms and the radicals R^4 and R^5 may also be part of a bridging aliphatic or aromatic ring,

with the proviso that when the metal of groups 8 to 10 of the Periodic Table is Pd, R^2 and/or R^3 have the meaning c), are used as catalyst.

2. The process as claimed in claim 1, wherein R^2, R^3, R^4, R^5, R^6 and R^7 are identical or different and have at least one substituent from the group consisting of -H, -CN, -COOH, -COO-alkyl, -COO-aryl, -OCO-alkyl, -OCO-aryl, -OCOO-alkyl, -OCOO-aryl, -CHO, -CO-alkyl, -CO-aryl, -aryl, -alkyl, -alkenyl, -allyl, -O-alkyl, -O-aryl, -NH2, -NH(alkyl), -N(alkyl)2, -NH(aryl), -N(alkyl)2, -F, -Cl, -Br, -I, -OH, -CF3, -NO2, -ferrocenyl, -SO3H, -PO3H2, where the alkyl groups have from 1 to 24, the alkenyl groups have from 2 to 24 carbon atoms, the allyl groups have from 3 to 24 carbon atoms and the aryl groups have from 5 to 24 carbon atoms.

3. The process as claimed in claim 1 or 2, wherein a nucleophile of the formula (II)

$$R^1\text{–}Z\text{–}R^{1'} \qquad \text{(II)}$$

where Z is O, $N(R^{1''})$, $S(O_2)$, $Si(R^{1''})(OH)$, C=O, $C(H_2)$, $C(H)(NO_2)$ or $N(CH_2CH{=}CH_2)$ and R^1, $R^{1'}$or $R^{1''}$ are identical or different and are each H, a substituted or unsubstituted, linear, branched or cyclic alkyl or alkenyl group having from 1 to 22 carbon atoms, a carboxyl group or an aryl group, where the radicals R^1, $R^{1'}$

may be joined to one another via covalent bonds and R^1 and $R^{1'}$ may bear identical or different substituents.

4. The process as claimed in at least one of claims 1 to 3, wherein compounds of the formula (IIa) or (IIb)

$$R^1\text{-O-H} \quad \text{(IIa)}, \qquad R^1\text{-N(}R^{1'}\text{)-H} \quad \text{(IIb)}$$

where R^1, $R^{1'}$ are identical or different and are each H, a substituted or unsubstituted, linear, branched or cyclic alkyl or alkenyl group having from 1 to 22 carbon atoms, a carboxyl group or an aryl group and the radicals R^1, $R^{1'}$ may be joined to one another via covalent bonds, are used as nucleophile.

5. The process as claimed in any of claims 1 to 4, wherein water, alcohols, phenols, polyols, carboxylic acids, ammonia and/or primary or secondary amines are used as nucleophiles.

6. The process as claimed in any of claims 1 to 5 carried out in a solvent, where the nucleophile (II) and/or inert organic solvents is/are used as solvent.

7. The process as claimed in any of claims 1 to 6, wherein the ratio of carbene ligand to metal [mol/mol] is from 0.01:1 to 250:1.